SEQUENCE LISTING

<110> ImmunoGen, Inc.

<120> ANTIBODIES TO NON-SHED MUC1 AND MUC16, AND USES THEREOF

<130> A8340

<150> US 60/393,094
<151> 2002-07-03

<160> 33

<170> PatentIn version 3.2

<210> 1
<211> 86
<212> PRT
<213> Homo sapiens

<400> 1

Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile
1 5 10 15

Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg
20 25 30

Glu Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr
35 40 45

Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser
50 55 60

Val Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val
65 70 75 80

Pro Gly Trp Gly Ile Ala
85

<210> 2
<211> 108
<212> PRT
<213> Homo sapiens

<400> 2

Thr Asn Tyr Gln Arg Asn Lys Arg Asn Ile Glu Asp Ala Leu Asn Gln
1 5 10 15

Leu Phe Arg Asn Ser Ser Ile Lys Ser Tyr Phe Ser Asp Cys Gln Val
20 25 30

Ser Thr Phe Arg Ser Val Pro Asn Arg His His Thr Gly Val Asp Ser
35 40 45

Leu Cys Asn Phe Ser Pro Leu Ala Arg Arg Val Asp Arg Val Ala Ile
50 55 60

Tyr Glu Glu Phe Leu Arg Met Thr Arg Asn Gly Thr Gln Leu Gln Asn
65 70 75 80

Phe Thr Leu Asp Arg Ser Ser Val Leu Val Asp Gly Tyr Ser Pro Asn
85 90 95

Arg Asn Glu Pro Leu Thr Gly Asn Ser Asp Leu Pro
100 105

<210> 3
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3

Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly
1 5 10 15

Val Thr Ser Ala
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<210> 4
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4

Phe Trp Ala Val Ile Leu Ile Gly Leu Ala Gly Leu Leu Gly Leu Ile
1 5 10 15

Thr Cys Leu Ile Cys Gly Val Leu Val
20 25

<210> 5
<211> 4
<212> PRT
<213> Homo sapiens

<400> 5

Arg Asn Lys Arg
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<210> 6
<211> 4
<212> PRT
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<400> 6

Ser Pro Leu Ala
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<210> 7
<211> 86
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<220>
<223> Fusion protein

<220>
<221> MISC_FEATURE
<222> (1)..(1)
<223> Glutathione S-transferase fusion site

<400> 7

Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile
1 5 10 15

Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg
20 25 30

Glu Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr
35 40 45

Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser
50 55 60

Val Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val
65 70 75 80

Pro Gly Trp Gly Ile Ala
85

<210> 8
<211> 21
<212> PRT
<213> Homo sapiens

<400> 8

Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp Val
1 5 10 15

Glu Thr Gln Phe Asn
20

<210> 9
<211> 21
<212> PRT
<213> Homo sapiens

<400> 9

Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp
1 5 10 15

Val Ser Val Ser Asp
20

<210> 10
<211> 21
<212> PRT
<213> Homo sapiens

<400> 10

Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile
1 5 10 15

Lys Phe Arg Pro Gly
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<210> 11
<211> 21
<212> PRT
<213> Homo sapiens

<400> 11

Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu
1 5 10 15

Gly Thr Ile Asn Val
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<210> 12
<211> 19
<212> PRT
<213> Homo sapiens

<400> 12

Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro Gly Trp
1 5 10 15

Gly Ile Ala

<210> 13
<211> 108
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<223> Fusion protein

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<223> Glutathione S-transferase fusion site

<400> 13

Thr Asn Tyr Gln Arg Asn Lys Arg Asn Ile Glu Asp Ala Leu Asn Gln
1 5 10 15

Leu Phe Arg Asn Ser Ser Ile Lys Ser Tyr Phe Ser Asp Cys Gln Val
20 25 30

Ser Thr Phe Arg Ser Val Pro Asn Arg His His Thr Gly Val Asp Ser
35 40 45

Leu Cys Asn Phe Ser Pro Leu Ala Arg Arg Val Asp Arg Val Ala Ile
50 55 60

Tyr Glu Glu Phe Leu Arg Met Thr Arg Asn Gly Thr Gln Leu Gln Asn
65 70 75 80

Phe Thr Leu Asp Arg Ser Ser Val Leu Val Asp Gly Tyr Ser Pro Asn
85 90 95

Arg Asn Glu Pro Leu Thr Gly Asn Ser Asp Leu Pro
100 105

<210> 14
<211> 20
<212> PRT
<213> Homo sapiens

<400> 14

Ser Ser Val Leu Val Asp Gly Tyr Ser Pro Asn Arg Asn Glu Pro Leu

1 5 10 15

Thr Gly Asn Ser
20

<210> 15
<211> 20
<212> PRT
<213> Homo sapiens

<400> 15

Thr Asn Tyr Gln Arg Asn Lys Arg Asn Ile Glu Asp Ala Leu Asn Gln
1 5 10 15

Leu Phe Arg Asn
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<210> 16
<211> 21
<212> PRT
<213> Homo sapiens

<400> 16

Phe Arg Asn Ser Ser Ile Lys Ser Tyr Phe Ser Asp Cys Gln Val Ser
1 5 10 15

Thr Phe Arg Ser Val
20

<210> 17
<211> 23
<212> PRT
<213> Homo sapiens

<400> 17

Ser Val Pro Asn Arg His His Thr Gly Val Asp Ser Leu Cys Asn Phe
1 5 10 15

Ser Pro Leu Ala Arg Arg Val
20

<210> 18
<211> 28
<212> PRT
<213> Homo sapiens

<400> 18

Asp Arg Val Ala Ile Tyr Glu Glu Phe Leu Arg Met Thr Arg Asn Gly

1 5 10 15

Thr Gln Leu Gln Asn Phe Thr Leu Asp Arg Ser Ser
20 25

<210> 19
<211> 515
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary Muc1 protein

<400> 19

Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Leu Thr
1 5 10 15

Val Leu Thr Val Val Thr Gly Ser Gly His Ala Ser Ser Thr Pro Gly
20 25 30

Gly Glu Lys Glu Thr Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser
35 40 45

Thr Glu Lys Asn Ala Val Ser Met Thr Ser Ser Val Leu Ser Ser His
50 55 60

Ser Pro Gly Ser Gly Ser Ser Thr Thr Gln Gly Gln Asp Val Thr Leu
65 70 75 80

Ala Pro Ala Thr Glu Pro Ala Ser Gly Ser Ala Ala Thr Trp Gly Gln
85 90 95

Asp Val Thr Ser Val Pro Val Thr Arg Pro Ala Leu Gly Ser Thr Thr
100 105 110

Pro Pro Ala His Asp Val Thr Ser Ala Pro Asp Asn Lys Pro Ala Pro
115 120 125

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
130 135 140

Arg Pro Pro Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
145 150 155 160

Ala Pro Asp Thr Arg Pro Pro Pro Gly Ser Thr Ala Pro Ala Ala His
165 170 175

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
180 185 190

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Asn Arg Pro Ala Leu
195 200 205

Ala Ser Thr Ala Pro Pro Val His Asn Val Thr Ser Ala Ser Gly Ser
210 215 220

Ala Ser Gly Ser Ala Ser Thr Leu Val His Asn Gly Thr Ser Ala Arg
225 230 235 240

Ala Thr Thr Thr Pro Ala Ser Lys Ser Thr Pro Phe Ser Ile Pro Ser
245 250 255

His His Ser Asp Thr Pro Thr Thr Leu Ala Ser His Ser Thr Lys Thr
260 265 270

Asp Ala Ser Ser Thr His His Ser Thr Val Pro Pro Leu Thr Ser Ser
275 280 285

Asn His Ser Thr Ser Pro Gln Leu Ser Thr Gly Val Ser Phe Phe Phe
290 295 300

Leu Ser Phe His Ile Ser Asn Leu Gln Phe Asn Ser Ser Leu Glu Asp
305 310 315 320

Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile Ser Glu Met
325 330 335

Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile
340 345 350

Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg
355 360 365

Glu Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr
370 375 380

Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser
385 390 395 400

Val Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val
405 410 415

Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala
420 425 430

Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg
435 440 445

Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His
450 455 460

Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro
465 470 475 480

Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn
485 490 495

Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser
500 505 510

Ala Asn Leu
515

<210> 20
<211> 2234
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary Muc16 protein

<400> 20

Met Glu His Ile Thr Lys Ile Pro Asn Glu Ala Ala His Arg Gly Thr
1 5 10 15

Ile Arg Pro Val Lys Gly Pro Gln Thr Ser Thr Ser Pro Ala Ser Pro
20 25 30

Lys Gly Leu His Thr Gly Gly Thr Lys Arg Met Glu Thr Thr Thr Thr
35 40 45

Ala Leu Lys Thr Thr Thr Thr Ala Leu Lys Thr Thr Ser Arg Ala Thr
50 55 60

Leu Thr Thr Ser Val Tyr Thr Pro Thr Leu Gly Thr Leu Thr Pro Leu
65 70 75 80

Asn Ala Ser Arg Gln Met Ala Ser Thr Ile Leu Thr Glu Met Met Ile

85 90 95

Thr Thr Pro Tyr Val Phe Pro Asp Val Pro Glu Thr Thr Ser Ser Leu
100 105 110

Ala Thr Ser Leu Gly Ala Glu Thr Ser Thr Ala Leu Pro Arg Thr Thr
115 120 125

Pro Ser Val Leu Asn Arg Glu Ser Glu Thr Thr Ala Ser Leu Val Ser
130 135 140

Arg Ser Gly Ala Glu Arg Ser Pro Val Ile Gln Thr Leu Asp Val Ser
145 150 155 160

Ser Ser Glu Pro Asp Thr Thr Ala Ser Trp Val Ile His Pro Ala Glu
165 170 175

Thr Ile Pro Thr Val Ser Lys Thr Thr Pro Asn Phe Phe His Ser Glu
180 185 190

Leu Asp Thr Val Ser Ser Thr Ala Thr Ser His Gly Ala Asp Val Ser
195 200 205

Ser Ala Ile Pro Thr Asn Ile Ser Pro Ser Glu Leu Asp Ala Leu Thr
210 215 220

Pro Leu Val Thr Ile Ser Gly Thr Asp Thr Ser Thr Thr Phe Pro Thr
225 230 235 240

Leu Thr Lys Ser Pro His Glu Thr Glu Thr Arg Thr Thr Trp Leu Thr
245 250 255

His Pro Ala Glu Thr Ser Ser Thr Ile Pro Arg Thr Ile Pro Asn Phe
260 265 270

Ser His His Glu Ser Asp Ala Thr Pro Ser Ile Ala Thr Ser Pro Gly
275 280 285

Ala Glu Thr Ser Ser Ala Ile Pro Ile Met Thr Val Ser Pro Gly Ala
290 295 300

Glu Asp Leu Val Thr Ser Gln Val Thr Ser Ser Gly Thr Asp Arg Asn
305 310 315 320

Met Thr Ile Pro Thr Leu Thr Leu Ser Pro Gly Glu Pro Lys Thr Ile

325 330 335

Ala Ser Leu Val Thr His Pro Glu Ala Gln Thr Ser Ser Ala Ile Pro
340 345 350

Thr Ser Thr Ile Ser Pro Ala Val Ser Arg Leu Val Thr Ser Met Val
355 360 365

Thr Ser Leu Ala Ala Lys Thr Ser Thr Thr Asn Arg Ala Leu Thr Asn
370 375 380

Ser Pro Gly Glu Pro Ala Thr Thr Val Ser Leu Val Thr His Pro Ala
385 390 395 400

Gln Thr Ser Pro Thr Val Pro Trp Thr Thr Ser Ile Phe Phe His Ser
405 410 415

Lys Ser Asp Thr Thr Pro Ser Met Thr Thr Ser His Gly Ala Glu Ser
420 425 430

Ser Ser Ala Val Pro Thr Pro Thr Val Ser Thr Glu Val Pro Gly Val
435 440 445

Val Thr Pro Leu Val Thr Ser Ser Arg Ala Val Ile Ser Thr Thr Ile
450 455 460

Pro Ile Leu Thr Leu Ser Pro Gly Glu Pro Glu Thr Thr Pro Ser Met
465 470 475 480

Ala Thr Ser His Gly Glu Glu Ala Ser Ser Ala Ile Pro Thr Pro Thr
485 490 495

Val Ser Pro Gly Val Pro Gly Val Val Thr Ser Leu Val Thr Ser Ser
500 505 510

Arg Ala Val Thr Ser Thr Thr Ile Pro Ile Leu Thr Phe Ser Leu Gly
515 520 525

Glu Pro Glu Thr Thr Pro Ser Met Ala Thr Ser His Gly Thr Glu Ala
530 535 540

Gly Ser Ala Val Pro Thr Val Leu Pro Glu Val Pro Gly Met Val Thr
545 550 555 560

Ser Leu Val Ala Ser Ser Arg Ala Val Thr Ser Thr Thr Leu Pro Thr

565 570 575

Leu Thr Leu Ser Pro Gly Glu Pro Glu Thr Thr Pro Ser Met Ala Thr
580 585 590

Ser His Gly Ala Glu Ala Ser Ser Thr Val Pro Thr Val Ser Pro Glu
595 600 605

Val Pro Gly Val Val Thr Ser Leu Val Thr Ser Ser Ser Gly Val Asn
610 615 620

Ser Thr Ser Ile Pro Thr Leu Ile Leu Ser Pro Gly Glu Leu Glu Thr
625 630 635 640

Thr Pro Ser Met Ala Thr Ser His Gly Ala Glu Ala Ser Ser Ala Val
645 650 655

Pro Thr Pro Thr Val Ser Pro Gly Val Ser Gly Val Val Thr Pro Leu
660 665 670

Val Thr Ser Ser Arg Ala Val Thr Ser Thr Thr Ile Pro Ile Leu Thr
675 680 685

Leu Ser Ser Ser Glu Pro Glu Thr Thr Pro Ser Met Ala Thr Ser His
690 695 700

Gly Val Glu Ala Ser Ser Ala Val Leu Thr Val Ser Pro Glu Val Pro
705 710 715 720

Gly Met Val Thr Ser Leu Val Thr Ser Ser Arg Ala Val Thr Ser Thr
725 730 735

Thr Ile Pro Thr Leu Thr Ile Ser Ser Asp Glu Pro Glu Thr Thr Thr
740 745 750

Ser Leu Val Thr His Ser Glu Ala Lys Met Ile Ser Ala Ile Pro Thr
755 760 765

Leu Ala Val Ser Pro Thr Val Gln Gly Leu Val Thr Ser Leu Val Thr
770 775 780

Ser Ser Gly Ser Glu Thr Ser Ala Phe Ser Asn Leu Thr Val Ala Ser
785 790 795 800

Ser Gln Pro Glu Thr Ile Asp Ser Trp Val Ala His Pro Gly Thr Glu

805 810 815

Ala Ser Ser Val Val Pro Thr Leu Thr Val Ser Thr Gly Glu Pro Phe
820 825 830

Thr Asn Ile Ser Leu Val Thr His Pro Ala Glu Ser Ser Ser Thr Leu
835 840 845

Pro Arg Thr Thr Ser Arg Phe Ser His Ser Glu Leu Asp Thr Met Pro
850 855 860

Ser Thr Val Thr Ser Pro Glu Ala Glu Ser Ser Ser Ala Ile Ser Thr
865 870 875 880

Thr Ile Ser Pro Gly Ile Pro Gly Val Leu Thr Ser Leu Val Thr Ser
885 890 895

Ser Gly Arg Asp Ile Ser Ala Thr Phe Pro Thr Val Pro Glu Ser Pro
900 905 910

His Glu Ser Glu Ala Thr Ala Ser Trp Val Thr His Pro Ala Val Thr
915 920 925

Ser Thr Thr Val Pro Arg Thr Thr Pro Asn Tyr Ser His Ser Glu Pro
930 935 940

Asp Thr Thr Pro Ser Ile Ala Thr Ser Pro Gly Ala Glu Ala Thr Ser
945 950 955 960

Asp Phe Pro Thr Ile Thr Val Ser Pro Asp Val Pro Asp Met Val Thr
965 970 975

Ser Gln Val Thr Ser Ser Gly Thr Asp Thr Ser Ile Thr Ile Pro Thr
980 985 990

Leu Thr Leu Ser Ser Gly Glu Pro Glu Thr Thr Thr Ser Phe Ile Thr
995 1000 1005

Tyr Ser Glu Thr His Thr Ser Ser Ala Ile Pro Thr Leu Pro Val
1010 1015 1020

Ser Pro Gly Ala Ser Lys Met Leu Thr Ser Leu Val Ile Ser Ser
1025 1030 1035

Gly Thr Asp Ser Thr Thr Thr Phe Pro Thr Leu Thr Glu Thr Pro

1040 1045 1050

Tyr Glu Pro Glu Thr Thr Ala Ile Gln Leu Ile His Pro Ala Glu
1055 1060 1065

Thr Asn Thr Met Val Pro Lys Thr Thr Pro Lys Phe Ser His Ser
1070 1075 1080

Lys Ser Asp Thr Thr Leu Pro Val Ala Ile Thr Ser Pro Gly Pro
1085 1090 1095

Glu Ala Ser Ser Ala Val Ser Thr Thr Thr Ile Ser Pro Asp Met
1100 1105 1110

Ser Asp Leu Val Thr Ser Leu Val Pro Ser Ser Gly Thr Asp Thr
1115 1120 1125

Ser Thr Thr Phe Pro Thr Leu Ser Glu Thr Pro Tyr Glu Pro Glu
1130 1135 1140

Thr Thr Val Thr Trp Leu Thr His Pro Ala Glu Thr Ser Thr Thr
1145 1150 1155

Val Ser Gly Thr Ile Pro Asn Phe Ser His Arg Gly Ser Asp Thr
1160 1165 1170

Ala Pro Ser Met Val Thr Ser Pro Gly Val Asp Thr Arg Ser Gly
1175 1180 1185

Val Pro Thr Thr Thr Ile Pro Pro Ser Ile Pro Gly Val Val Thr
1190 1195 1200

Ser Gln Val Thr Ser Ser Ala Thr Asp Thr Ser Thr Ala Ile Pro
1205 1210 1215

Thr Leu Thr Pro Ser Pro Gly Glu Pro Glu Thr Thr Ala Ser Ser
1220 1225 1230

Ala Thr His Pro Gly Thr Gln Thr Gly Phe Thr Val Pro Ile Arg
1235 1240 1245

Thr Val Pro Ser Ser Glu Pro Asp Thr Met Ala Ser Trp Val Thr
1250 1255 1260

His Pro Pro Gln Thr Ser Thr Pro Val Ser Arg Thr Thr Ser Ser

1265 1270 1275

Phe Ser His Ser Ser Pro Asp Ala Thr Pro Val Met Ala Thr Ser
1280 1285 1290

Pro Arg Thr Glu Ala Ser Ser Ala Val Leu Thr Thr Ile Ser Pro
1295 1300 1305

Gly Ala Pro Glu Met Val Thr Ser Gln Ile Thr Ser Ser Gly Ala
1310 1315 1320

Ala Thr Ser Thr Thr Val Pro Thr Leu Thr His Ser Pro Gly Met
1325 1330 1335

Pro Glu Thr Thr Ala Leu Leu Ser Thr His Pro Arg Thr Gly Thr
1340 1345 1350

Ser Lys Thr Phe Pro Ala Ser Thr Val Phe Pro Gln Val Ser Glu
1355 1360 1365

Thr Thr Ala Ser Leu Thr Ile Arg Pro Gly Ala Glu Thr Ser Thr
1370 1375 1380

Ala Leu Pro Thr Gln Thr Thr Ser Ser Leu Phe Thr Leu Leu Val
1385 1390 1395

Thr Gly Thr Ser Arg Val Asp Leu Ser Pro Thr Ala Ser Pro Gly
1400 1405 1410

Val Ser Ala Lys Thr Ala Pro Leu Ser Thr His Pro Gly Thr Glu
1415 1420 1425

Thr Ser Thr Met Ile Pro Thr Ser Thr Leu Ser Leu Gly Leu Leu
1430 1435 1440

Glu Thr Thr Gly Leu Leu Ala Thr Ser Ser Ser Ala Glu Thr Ser
1445 1450 1455

Thr Ser Thr Leu Thr Leu Thr Val Ser Pro Ala Val Ser Gly Leu
1460 1465 1470

Ser Ser Ala Ser Ile Thr Thr Asp Lys Pro Gln Thr Val Thr Ser
1475 1480 1485

Trp Asn Thr Glu Thr Ser Pro Ser Val Thr Ser Val Gly Pro Pro

1490 1495 1500

Glu Phe Ser Arg Thr Val Thr Gly Thr Thr Met Thr Leu Ile Pro
1505 1510 1515

Ser Glu Met Pro Thr Pro Pro Lys Thr Ser His Gly Glu Gly Val
1520 1525 1530

Ser Pro Thr Thr Ile Leu Arg Thr Thr Met Val Glu Ala Thr Asn
1535 1540 1545

Leu Ala Thr Thr Gly Ser Ser Pro Thr Val Ala Lys Thr Thr Thr
1550 1555 1560

Thr Phe Asn Thr Leu Ala Gly Ser Leu Phe Thr Pro Leu Thr Thr
1565 1570 1575

Pro Gly Met Ser Thr Leu Ala Ser Glu Ser Val Thr Ser Arg Thr
1580 1585 1590

Ser Tyr Asn His Arg Ser Trp Ile Ser Thr Thr Ser Ser Tyr Asn
1595 1600 1605

Arg Arg Tyr Trp Thr Pro Ala Thr Ser Thr Pro Val Thr Ser Thr
1610 1615 1620

Phe Ser Pro Gly Ile Ser Thr Ser Ser Ile Pro Ser Ser Thr Ala
1625 1630 1635

Ala Thr Val Pro Phe Met Val Pro Phe Thr Leu Asn Phe Thr Ile
1640 1645 1650

Thr Asn Leu Gln Tyr Glu Glu Asp Met Arg His Pro Gly Ser Arg
1655 1660 1665

Lys Phe Asn Ala Thr Glu Arg Glu Leu Gln Gly Leu Leu Lys Pro
1670 1675 1680

Leu Phe Arg Asn Ser Ser Leu Glu Tyr Leu Tyr Ser Gly Cys Arg
1685 1690 1695

Leu Ala Ser Leu Arg Pro Glu Lys Asp Ser Ser Ala Met Ala Val
1700 1705 1710

Asp Ala Ile Cys Thr His Arg Pro Asp Pro Glu Asp Leu Gly Leu

1715 1720 1725

Asp Arg Glu Arg Leu Tyr Trp Glu Leu Ser Asn Leu Thr Asn Gly
1730 1735 1740

Ile Gln Glu Leu Gly Pro Tyr Thr Leu Asp Arg Asn Ser Leu Tyr
1745 1750 1755

Val Asn Gly Phe Thr His Arg Ser Ser Met Pro Thr Thr Ser Thr
1760 1765 1770

Pro Gly Thr Ser Thr Val Asp Val Gly Thr Ser Gly Thr Pro Ser
1775 1780 1785

Ser Ser Pro Ser Pro Thr Ala Ala Gly Pro Leu Leu Met Pro Phe
1790 1795 1800

Thr Leu Asn Phe Thr Ile Thr Asn Leu Gln Tyr Glu Glu Asp Met
1805 1810 1815

Arg Arg Thr Gly Ser Arg Lys Phe Asn Thr Met Glu Ser Val Leu
1820 1825 1830

Gln Gly Leu Leu Lys Pro Leu Phe Lys Asn Thr Ser Val Gly Pro
1835 1840 1845

Leu Tyr Ser Gly Cys Arg Leu Thr Leu Leu Arg Pro Glu Lys Asp
1850 1855 1860

Gly Ala Ala Thr Gly Val Asp Ala Ile Cys Thr His Arg Leu Asp
1865 1870 1875

Pro Lys Ser Pro Gly Leu Asn Arg Glu Gln Leu Tyr Trp Glu Leu
1880 1885 1890

Ser Lys Leu Thr Asn Asp Ile Glu Glu Leu Gly Pro Tyr Thr Leu
1895 1900 1905

Asp Arg Asn Ser Leu Tyr Val Asn Gly Phe Thr His Gln Ser Ser
1910 1915 1920

Val Ser Thr Thr Ser Thr Pro Gly Thr Ser Thr Val Asp Leu Arg
1925 1930 1935

Thr Ser Gly Thr Pro Ser Ser Leu Ser Ser Pro Thr Ile Thr Leu

1940 1945 1950

Leu Arg Asp Ile Gln Asp Lys Val Thr Thr Leu Tyr Lys Gly Ser
1955 1960 1965

Gln Leu His Asp Thr Phe Arg Phe Cys Leu Val Thr Asn Leu Thr
1970 1975 1980

Met Asp Ser Val Leu Val Thr Val Lys Ala Leu Phe Ser Ser Asn
1985 1990 1995

Leu Asp Pro Ser Leu Val Glu Gln Val Phe Leu Asp Lys Thr Leu
2000 2005 2010

Asn Ala Ser Phe His Trp Leu Gly Ser Thr Tyr Gln Leu Val Asp
2015 2020 2025

Ile His Val Thr Glu Met Glu Ser Ser Val Tyr Gln Pro Thr Ser
2030 2035 2040

Ser Ser Ser Thr Gln His Phe Tyr Pro Asn Phe Thr Ile Thr Asn
2045 2050 2055

Leu Pro Tyr Ser Gln Asp Lys Ala Gln Pro Gly Thr Thr Asn Tyr
2060 2065 2070

Gln Arg Asn Lys Arg Asn Ile Glu Asp Ala Leu Asn Gln Leu Phe
2075 2080 2085

Arg Asn Ser Ser Ile Lys Ser Tyr Phe Ser Asp Cys Gln Val Ser
2090 2095 2100

Thr Phe Arg Ser Val Pro Asn Arg His His Thr Gly Val Asp Ser
2105 2110 2115

Leu Cys Asn Phe Ser Pro Leu Ala Arg Arg Val Asp Arg Val Ala
2120 2125 2130

Ile Tyr Glu Glu Phe Leu Arg Met Thr Arg Asn Gly Thr Gln Leu
2135 2140 2145

Gln Asn Phe Thr Leu Asp Arg Ser Ser Val Leu Val Asp Gly Tyr
2150 2155 2160

Ser Pro Asn Arg Asn Glu Pro Leu Thr Gly Asn Ser Asp Leu Pro

2165 2170 2175

Phe Trp Ala Val Ile Leu Ile Gly Leu Ala Gly Leu Leu Gly Leu
2180 2185 2190

Ile Thr Cys Leu Ile Cys Gly Val Leu Val Thr Thr Arg Arg Arg
2195 2200 2205

Lys Lys Glu Gly Glu Tyr Asn Val Gln Gln Gln Cys Pro Gly Tyr
2210 2215 2220

Tyr Gln Ser His Leu Asp Leu Glu Asp Leu Gln
2225 2230

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<212> DNA
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<400> 21
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tctagattcc gaaacagcag catcaagagt tatttttctg actgtcaagt ttcaacattc 180

aggtctgtcc ccaacaggca ccacaccggg gtggactccc tgtgtaactt ctcgccactg 240

gctcggagag tagacagagt tgccatctat gaggaatttc tgcggatgac ccggaatggt 300

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aacagaaatg agcccttaac tgggaattct gaccttccct tctgggctgt catcctcatc 420

ggcttggcag gactcctggg actcatcaca tgcctgatct gcggtgtcct ggtgaccacc 480

cgccggcgga agaaggaagg agaatacaac gtccagcaac agtgcccagg ctactaccag 540

tcacacctag acctggagga tctgcaagcg gccgctcgag ccaccatgga acaaaaactc 600

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aaactcatct cagaagagga tctgaccggt taaatgcatc tagagggccc 710

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<212> DNA
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<210> 25
<211> 30
<212> DNA
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<400> 25
atgggccaac ccggctccct caagttcaac 30

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<212> DNA
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<400> 26
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<210> 27
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<400> 27
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<210> 29
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<400> 29
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<210> 31
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<400> 31
caagtctaga ttccgaaaca gcagcatcaa 30

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<220>
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<210> 33
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<220>
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<400> 33
ggaatctaga cttgtcatcg tcgtccttgt agtcggtaga gcttgcatga ccagaa 56